Background: Five percent of the proximal humerus fractures will need surgical fixation. The two commonly used methods are open reduction internal fixation and closed intramedullary nailing. The fixation failure seems to remain a problem. The authors have tried to answer how these implants fail and whether the implants have a role in failure regardless of the fracture personality.

Null hypothesis: Failure of fracture fixation in proximal humerus is independent of the implant used.

Methodology: In vitro testing of proximal humerus fixation devices undertaken in a low density bone model. A fracture-line was created at the surgical neck of humerus in all samples and fixed with five fixation devices; three plating and two nailing devices. The samples were subjected to failure under different biomechanical stresses.

Results: Failure was achieved in all models. The failure pattern broadly fell in three different categories. In torque testing the two conventional plates Cloverleaf and T-plate behaved similarly failing by screws pulling out from both the proximal and distal fragment with a twisted plate. The PHILOS plate failed by avulsion of a wedge just distal to the fracture site with screws remaining embedded in the bone. Both the nailing systems, Polaris and European humeral nail, failed by a spiral fracture starting at the distal locking screw.

In compression the Cloverleaf and T-plate failed by plate bending, backing out of the screw in the proximal fragment followed by fracture of the distal fragment. The PHILOS failed by plate bending and fracture of the distal fragment distal to the last locking screws. Both the nails, the proximal fragment screws failed.

Conclusion: Implant properties play a role in proximal humerus fracture fixation failure. The fractures with proximal communution and the ones with extension to shaft fragment are biomechanically suited to be fixed by PHILOS and IM nails, respectively. It is important that the potential point of failure (proximal or distal fragment) should be considered in the pre-operative planning phase to avoid the likelihood of fixation failure.

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Hook plate fixation for Neer's type II fracture of the lateral end of clavicle: Does it work?

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Treatment of Neer's type II fractures of the lateral end of the clavicle is difficult and controversial. We present the results of 22 patients who underwent clavicular hook plate fixation for these fractures between 1997 and 2004. The average age was 42 years (range16—78 years). The average follow up was 39 months (range 12—72). One patient developed a non-union and another a stress fracture. The fixation failed in two cases: one plate unhooked from beneath the acromion and the screws of another plate pulled of the clavicle. Twenty-one patients achieved union and nineteen patients were satisfied with their outcome. We recommend the clavicular hook plate fixation for fractures of the lateral end of the clavicle as an alternative management method.

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Hook plate in clavicular pathology in a DGH

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Aim: Aim of this study is to review the results of fixation of lateral end clavicle fractures and acromioclavicular dislocations using acromioclavicular (AC) hook plate.

Patients and methods: Fourteen patients were treated with acromioclavicular hook plate fixation. Indications for surgery were symptomatic non-union or displaced fractures of the lateral end of the clavicle in five and type 3 or above acromioclavicular joint dislocations in nine. All patients underwent the procedure through a shoulder strap incision along the Langer line. Patients with ACJ dislocations underwent coracoclavicular ligament reconstruction in addition to AC hook plate fixation. Postoperatively arm was supported in a shoulder sling and overhead shoulder movements were restricted until the hook plate was removed. All patients were followed up clinically and radiologically. Functional assessment was conducted using the DASH scores.

Results: There were 12 male and 2 female patients with a mean age of 34 years (range 20—52 years). Mean follow up was 7.2 months (range 5—18 months). Coracoclavicular ligaments reconstructed using Weaver Dun procedure in nine patients. Two patients had impingement on abduction which resolved after removal of hook plate. One patient had fracture of the clavicle medial to the plate during post op rehabilitation which was trea-

ted conservatively. Radiographic union occurred in all patients with clavicle fractures after a mean period of 12 weeks (range 8—16 weeks). All but one the hook plate removed at an average 5 months post op. At final follow up all patients were pain free, the AC joint was found to be adequately reduced in those patients with ACJ dislocation and the mean DASH score was 12.

Conclusion: AC hook plate fixation is a safe and effective fixation for the treatment of symptomatic non-union and displaced fractures of lateral end of clavicle and ACJ dislocation. We recommend restriction of extreme abduction and external rotation until the removal of the implant.

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Can all humeral fractures be treated conservatively?

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Introduction: Fractures of the shaft of the humerus are often conservatively in a hanging cast or a humeral brace. The conservative management of this fracture is often prolonged and quite uncomfortable for the patient. Some of the patients will need an operative fixation after a trial of conservative management.

Methods: We retrospectively looked at 72 consecutive patients with fractures of the shaft of the humerus that presented in our institution over a period of 2 years. The fracture pattern, treatment modality time to union and the number that needed operative fixation following a trial of conservative treatment were analysed.

Results: Of the 72 patients 4 were lost to follow up. Forty-five patients had a 1.2.B or 1.2.C type of fracture and 23 had a 1.2.A type of fracture. Twenty-eight (41%) were successfully treated conservatively, 11 (16%) patients were operated as the primary procedure and 16 (23%) patients were operated due to delayed or non union. Twelve (18%) patients were operated within 4 weeks of the fracture as their alignment was not acceptable on their weekly follow up. The average time to union in the patients treated conservatively was 22 weeks, while that of the patients treated primarily by operative fixation was 17.2 weeks (p-value < 0.05). Patients who needed operation after initial conservative management required prolonged period of rehabilitation and union time was 32.2 weeks.

Conclusion: In conclusion careful consideration should be given before it is decided to treat this fracture conservatively especially in the case of 1.2.A fracture pattern.

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Methods of coraco-clavicular ligament reconstruction: A comparison of the modified Weaver-Dunn and Surgilig surgical techniques

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Disruption of the acromio-clavicular joint is a relatively common injury occurring as the result of direct trauma. Surgical intervention tends to be reserved for symptomatic severe disruptions (Rockwood Grades III—VI).

Many different surgical techniques have been described dating back to Cooper in 1861 using silver wire to reduce the acromio-clavicular joint. In more recent times, techniques such as the modified Weaver-Dunn, and the Surgilig (Surgicraft Ltd., Redditch, UK) have been developed. These two procedures have been the treatment of choice in our hospital for the last 18 months.

The modified Weaver-Dunn technique aims to stabilise the clavicle by transferring the coracoacromial ligament to the distal clavicle and augment this with Ethibond™ (Ethicon, Inc.) sutures passed around the coracoid and through holes drilled into the clavicle.

The Surgilig (Surgicraft Ltd., Redditch, UK) sling is fixed using a bicortical screw to the superior edge of the clavicle. The sling is passed around the anterior of the coracoid and secured. Traction is applied to achieve anatomical reduction of the joint.

We have a series of 18 patients (9 in each treatment group). A standard rehabilitation has been used for all patients with physiotherapy. Surgical results have been assessed for each treatment modality using the Constant and Murley, and the American Shoulder and Elbow Score (ASES) systems.

Both techniques have achieved excellent results, with average scores of over 90 (out of 100) for both Constant and Murley, and ASES scoring systems. Complications were limited to several patients developing superficial infection in each group.

We conclude that both Weaver-Dunn and the Surgilig system are suitable treatments for displaced acromio-clavicular joint disruptions, and the choice